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# BMJ Open

## Access to health care for men and women with disabilities in the UK: A nationwide cross-sectional study

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**Title: Access to health care for men and women with disabilities in the UK: A nationwide cross-sectional study**

Dikaïos Sakellariou<sup>1</sup> and Elena S. Rotarou<sup>2</sup>

<sup>1</sup> Dikaïos Sakellariou

Corresponding author: Cardiff University, School of Healthcare Sciences,  
Eastgate House, Newport Road 35-43, Cardiff, CF24 0AB

Email: [sakellarioud@cardiff.ac.uk](mailto:sakellarioud@cardiff.ac.uk)

Telephone number: 02920687744

<sup>2</sup> Elena S. Rotarou

University of Chile, Department of Economics,  
Diagonal Paraguay 257, Office 1506, Santiago, 8330015, Chile

Email: [erotarou@fen.uchile.cl](mailto:erotarou@fen.uchile.cl)

Telephone number: (56-2) 978-3455

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**Access to health care for men and women with disabilities in the UK: A  
nationwide cross-sectional study**

**ABSTRACT**

**Objectives:** The aim of this study was to investigate differences in access to healthcare between people with and without disabilities in the UK. The hypotheses were that: a) People with disabilities would be more likely to have unmet health care needs; and b) There would be gender differences, with women more likely to report unmet needs.

**Setting and Participants:** The sample included 11,033 community-dwelling men and women over the age of 16 from across the UK, 4,422 of whom had a disability.

**Outcome measures:** Unmet need for health care due to long waiting lists, or distance or transportation problems; Not being able to afford medical examination, treatment, mental health care, or prescribed medicines.

**Results:** We performed secondary analysis, using logistic regressions, of de-identified cross-sectional data from the European Health Interview Survey (EHIS, Wave 2). Adjusting for age, sex, employment, and other factors, people with a severe disability had higher odds of facing unmet needs. The largest gap was in 'unmet need for mental health care due to cost', where people with a disability were 4.7 times (CI 95%: 2.237-9.710) more likely to face a problem, as well as in 'unmet need due to cost of prescribed medicine', where they had 3.9 (CI 95%: 2.218-6.777) higher odds of facing a difficulty. Women with a disability were 7.2 times (CI 95%: 3.301-15.609) more likely to have unmet needs due to cost of care or prescribed medicines, compared to men with no disability.

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**Conclusions:** People with disabilities reported worse access to health care, with transportation, cost, and long waiting lists being the main barriers. Furthermore, women reported worse access to health care. These findings are particularly alarming as they illustrate that a section of the population, who may have higher health care needs, face increased barriers in accessing services.

**Strengths and limitations of this study**

- This study is based on a nationally-representative sample of community-dwelling men and women.
- We focus on gender differences regarding unmet needs between people with and without disabilities.
- We explore unmet needs due to long waiting lists, distance or transportation problems, and also due to cost.
- The study’s cross-sectional design precludes any causal inference.

## INTRODUCTION

The aim of this study is to explore access to health care for people with disabilities in the United Kingdom, and more specifically, to uncover possible differences in unmet health care needs between people with and without disabilities. Disability is common in the population in the UK: it is estimated that 19% of the population live with a disability.[1] Despite this, disabled people's access to health care services in the UK has been little explored.

Access to health care has several dimensions: service availability, utilisation of services, and relevance of services.[2] In this article, we focus on the utilisation of services and barriers to it, with a specific emphasis on unmet health care needs. The British National Health Service (NHS) has been built on the principle of delivering equal access to health care for all. As Wenzl, McCuskee and Mossialos[3] stress, the NHS should be expected to work towards greater access to health care and a reduction in health inequalities. However, the extent that this has either been realised or operationalised through the establishment of concrete policies is debatable.[4] Powell and Exworthy[5] argue that most of the NHS policies that aim to provide an equitable service, focus on service availability rather than on any other dimension of access and conclude that there is a "...discrepancy between the 'paper' aim of equal access and the operational aim of equal provision" (p.59). The 2010 Equity and Excellence document[6] put service accessibility at its core, but failed to either acknowledge the differential demands to health care of people or the different resources that people have at their disposal.

In the UK, there are well-evidenced, long-standing inequalities both in terms of access to health care, unmet need, and health outcomes.[7-10] However, there is

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only limited information about access to health care for people with disabilities. [11-13]

Various studies have shown that disability is an added impediment in accessing health services. [14-18] A systematic review[12] on access to health care demonstrated that “...disabled people are restricted in accessing health care and report less satisfaction with their medical care” (p.21). Some of the barriers to health care access include lack of transport and inaccessible buildings.[12] People with disabilities often report that they their needs are not understood or that they are treated as patients of low priority.[12]

This study aims to contribute to existing knowledge regarding access to health care for disabled people in the UK, by producing population-level evidence regarding access to health care services, introducing cost-related factors as significant determinants behind barriers to such services. This knowledge can guide policy makers in the design of comprehensive support systems to enable real access to services, addressing not only the availability of services but also their utilisation.

**METHODOLOGY**

**Aims and hypotheses**

The main aim of this study is to investigate possible differences in unmet needs between people with and without disabilities in the UK. We use the term *people with disabilities* to refer to people who have a long-standing (more than 6 months) health condition or impairment and experience activity limitations. The study’s hypotheses are that: a) People with disabilities are more likely to have unmet health care needs; and b) There are gender differences in unmet health care needs, with women more likely to report more unmet needs than men.

## Methods

We performed secondary analysis, using logistic regressions, of de-identified cross-sectional data from the European Health Interview Survey (EHIS, Wave 2). This survey was carried out in 2014,[19] as a follow-up to the Labour Force Survey (LFS). Access to the dataset was granted by the UK Data Service (www.ukdataservice.ac.uk).

The EHIS consists of four modules: a) socioeconomic and demographic variables, such as age, sex, marital status, etc.; b) variables on health status, for example self-assessed health, chronic conditions, limitations in daily activities, etc.; c) variables on health care use, such as consultations, unmet needs, preventive actions, etc.; and d) health determinants, for instance weight, smoking, alcohol consumption, etc.[20] The questions analyse 21 areas of health concerns / related behaviours, and 81 specific item-questions.[21]

The UK opted out from the first EHIS wave (2006-2009), but did take part in the 2014 EHIS, Wave 2. Data for England, Wales, and Scotland were collected between April 2013 and March 2014 and for Northern Ireland between April and September 2014. The UK survey targeted individuals over the age of 16[21] and included a total of 20,161 observations, a sample size which was much higher than the estimated minimum effective size for the country, which was 13,085.[22] The sample design stratified households by a) country (England, Wales, Scotland, and Northern Ireland), b) mode (face-to-face interviews, encompassing 20% of all interviews, and telephone interviews, through Computer Assisted Telephone Interviews), and c) final wave of LFS contact.[19]

## Data and variables



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In order to define the variable ‘disability’, the answers to two questions were merged into a new variable. The first question (HS2) was “Long-standing health problem: Suffer from any illness or health problem of a duration of at least six months” with answers yes/no. The second one (HS3) was “General activity limitation: Limitation in activities people usually do because of health problems for at least the past six months”, with the possible answers being ‘severely limited’, ‘limited but no severely’, and ‘not limited at all’. Thus, the variable ‘disability’ included three possible answers: ‘no disability’ (that is, no long-standing health problem), ‘mild disability’ (people who answered ‘yes’ to HS2, and ‘limited but not severely’ to HS3), and ‘severe disability’ (people who answered ‘yes’ to HS2, and ‘severely limited’ to HS3). According to this categorisation, the total number of observations for ‘disability’ was 15,488; due to case-deletion, 11,033 observations were included in this study.

We used the following five binary variables to assess unmet health care needs:

- a) Unmet need for health care in the past 12 months due to long waiting list(s); b) Unmet need for health care in the past 12 months due to distance or transportation problems; c) Could not afford medical examination or treatment in the past 12 months; d) Could not afford prescribed medicines in the past 12 months; e) Could not afford mental health care (by a psychologist or a psychiatrist, for example) in the past 12 months.

The control variables in our study include the following: a) *gender*: male / female; b) *age*: 16-29 / 30-44 / 45-59 / 60-79 / 80+; c) *civil status*: unmarried / married / widowed / divorced; d) *region*: England, Wales, Scotland, Northern Ireland; e) *urbanisation level*: densely-populated area / intermediate-populated area / thinly-populated area; f) *nationality*: British / not British; g) *employment*: employed / unemployed / inactive; h) *education*: secondary / tertiary, technical / tertiary,

university; i) *health self-assessment*: good / fair / bad; and j) *income quintiles* (net monthly equivalised household income): below 1<sup>st</sup> quintile / between 1<sup>st</sup> and 2<sup>nd</sup> quintile / between 2<sup>nd</sup> and 3<sup>rd</sup> quintile / between 3<sup>rd</sup> and 4<sup>th</sup> quintile / between 4<sup>th</sup> and 5<sup>th</sup> quintile. We performed logistic regressions using STATA Version SE 11.2 so as to investigate unmet health care needs between people with and without disabilities.

## RESULTS

### Descriptive statistics

Table 1 summarises the characteristics of the study sample.

**Table 1:** Comparison among people without a disability, people with a mild disability, and people with a severe disability

Parameter	Without a disability (n=6,611)		With a mild disability (n=3,192)		With a severe disability (n=1,230)		p value
	n	%	n	%	n	%	
<b>Gender</b>							
Male (n=4,719)	2,889	43.70	1,308	40.98	522	42.44	$p = 0.037$
Female (n=6,314)	3,722	56.30	1,884	59.02	708	57.56	
<b>Age groups</b>							
16-29 (n=921)	771	11.66	124	3.88	26	2.11	$p < 0.000$
30-44 (n=2,256)	1,795	27.15	348	10.90	113	9.19	
45-59 (n=2,895)	1,866	28.23	707	22.15	322	26.18	
60-79 (n=4,293)	1,965	29.72	1,700	53.26	628	51.06	
80+ (n=668)	214	3.24	313	9.81	141	11.46	
<b>Urbanisation (degree)</b>							
Densely-populated area (n=6,493)	3,864	58.45	1,890	59.21	739	60.08	$p = 0.735$
Intermediate-populated area (n=2,971)	1,786	27.02	858	26.88	327	26.59	
Thinly-populated area (n=1,569)	961	14.54	444	13.91	164	13.33	
<b>Regions</b>							
England (n=9,129)	5,489	83.03	2,650	83.02	990	80.49	$p < 0.000$
Wales (n=529)	294	4.45	172	5.39	63	5.12	

	Scotland (n=957)	604	9.14	255	7.99	98	7.97	
	Northern Ireland (n=418)	224	3.39	115	3.60	79	6.42	
Civil status								
	Not married (n=2,279)	1,623	24.55	476	14.91	180	14.63	<i>p</i> < 0.000
	Married (n=6,329)	3,921	59.31	1,791	56.11	617	50.16	
	Widowed (n=1,132)	435	6.58	479	15.01	218	17.72	
	Divorced (n=1,293)	632	9.56	446	13.97	215	17.48	
Nationality								
	British (n=10,608)	6,276	94.93	3,124	97.87	1,208	98.21	<i>p</i> < 0.000
	Not British (n=425)	335	5.07	68	2.13	22	1.79	
Employment								
	Employed (n=5,258)	4,143	62.67	962	30.14	153	12.44	<i>p</i> < 0.000
	Unemployed (n=515)	278	4.21	173	5.42	64	5.20	
	Inactive (n=5,260)	2,190	33.13	2,057	64.44	1,013	82.36	
Education								
	Secondary (n=7,290)	3,987	60.31	2,301	72.09	1,002	81.46	<i>p</i> < 0.000
	Tertiary, technical (n=1,626)	1,041	15.75	452	14.16	133	10.81	
	Tertiary, university (n=2,117)	1,583	23.94	439	13.75	95	7.72	
Health self-assessment								
	Bad (n=1,165)	16	0.24	441	13.82	708	57.56	<i>p</i> < 0.000
	Fair (n=2,303)	395	5.97	1,550	48.56	358	29.11	
	Good (n=7,565)	6,200	93.78	1,201	37.63	164	13.33	
Income quintiles								
	Below 1 <sup>st</sup> quintile (n=2,156)	972	14.70	773	24.22	411	33.41	<i>p</i> < 0.000
	Between 1 <sup>st</sup> and 2 <sup>nd</sup> quintile (n=2,262)	1,160	17.55	748	23.43	354	28.78	
	Between 2 <sup>nd</sup> and 3 <sup>rd</sup> quintile (n=2,151)	1,284	19.42	645	20.21	222	18.05	
	Between 3 <sup>rd</sup> and 4 <sup>th</sup> quintile (n=2,243)	1,552	23.48	547	17.14	144	11.71	
	Between 4 <sup>th</sup> and 5 <sup>th</sup> quintile (n=2,221)	1,643	24.85	479	15.01	99	8.05	

Figure 1 shows the frequency distribution of unmet health care needs in the UK between people without a disability, people with a mild disability, and people with a severe disability.

Figure 1

As can be seen in Figure 1, the highest percentage of people with unmet health care needs are people with a severe disability. The highest percentage of people having an unmet need is the one related to long waiting list, and the smallest one is the one associated with unmet need for mental health care due to cost. All differences are statistically significant.

### Logistic regressions

Logistic regressions were employed in order to investigate the impact of various factors on unmet needs for health care in the UK. No collinearity distorted the results. There was a relatively higher correlation between the five groups of *age* (with a variance inflation factor-VIF between 2.33 and 5.30). However, this is often the case when dealing with dummy variables that represent a categorical variable with three or more categories, and – being relatively small – they have no effect on the regression.[23] The mean VIF for all variables was 1.86.

The results of the logistic regressions are shown in Table 2.

**Table 2:** Unmet needs for health care between people without a disability, people with a mild disability, and people with a severe disability,  
Unadjusted and adjusted odds ratios\*

Parameters	Unadjusted OR (95% C.I.)	Adjusted OR (95% C.I.)
<b>Unmet need due to long waiting list(s)</b>		
People with a mild disability	2.046*** (1.825-2.293)	1.990*** (1.714-2.310)
People with a severe disability	2.746*** (2.369-3.185)	2.341*** (1.893-2.895)
<b>Unmet need due to distance or transportation problems</b>		
People with a mild disability	3.071*** (2.138-4.412)	2.211** (1.380-3.542)
People with a severe disability	9.988*** (7.014-14.223)	4.657*** (2.707-8.013)

<b>Unmet need due to cost of medical examination or treatment</b>		
People with a mild disability	2.746*** (1.909-3.949)	2.376*** (1.477-3.823)
People with a severe disability	4.240*** (2.795-6.432)	3.380*** (1.837-6.219)
<b>Unmet need due to cost of prescribed medicines</b>		
People with a mild disability	2.566*** (1.639-4.016)	3.877*** (2.218-6.777)
People with a severe disability	3.739*** (2.216-6.308)	5.703*** (2.662-12.219)
<b>Unmet need for mental health care due to cost</b>		
People with a mild disability	3.928*** (2.178-7.084)	4.661*** (2.237-9.710)
People with a severe disability	6.086*** (3.154-11.742)	7.539*** (2.971-19.131)

Reference: People without a disability

\*Adjusted for age, sex and other variables presented in Table 1.

\*\*  $p < 0.01$ , \*\*\*  $p < 0.001$

Observations= 11,033

As it can be seen from Table 2, people with a severe disability are the most likely to face unmet needs in health care, followed by people with a mild disability. The largest gap can be seen in the category of ‘unmet need for mental health care due to cost’, where people with a disability were from 4.7 to 7.5 times more likely to face a problem, as well as for the category ‘unmet need due to cost of prescribed medicine’, where they were from 3.9 to 5.7 times more likely to face a difficulty.

Table 3 shows gender differences between people with and without a disability. The two subcategories of disability (mild and severe) were joined into one: people with disabilities.

**Table 3:** Gender differences between people with and without a disability, Unadjusted and adjusted odds ratios \*

Parameters	Unadjusted OR		Adjusted OR	
	OR	95% C.I.	OR	95% C.I.
Unmet need due to long waiting list(s)				
Women without a disability	1.429***	1.221-1.672	1.424***	1.215-1.670

Men with a disability	2.528 <sup>***</sup>	2.137-2.991	2.316 <sup>***</sup>	1.897-2.826
Women with a disability	2.930 <sup>***</sup>	2.511-3.419	2.667 <sup>***</sup>	2.212-3.216
<b>Unmet need due to distance or transportation problems</b>				
Women without a disability	.715	.409-1.247	.658	.375-1.155
Men with a disability	3.604 <sup>***</sup>	2.261-5.745	1.867 <sup>*</sup>	1.053-3.309
Women with a disability	4.511 <sup>***</sup>	2.923-6.961	2.115 <sup>**</sup>	1.225-3.651
<b>Unmet need due to cost of medical examination or treatment</b>				
Women without a disability	1.244	.710-2.180	1.248	.702-2.197
Men with a disability	3.206 <sup>***</sup>	1.868-5.501	2.545 <sup>**</sup>	1.350-4.797
Women with a disability	3.865 <sup>***</sup>	2.341-6.381	3.066 <sup>***</sup>	1.686-5.576
<b>Unmet need due to cost of prescribed medicines</b>				
Women without a disability	1.947	.934-4.060	1.783	.851-3.738
Men with a disability	2.860 <sup>**</sup>	1.317-6.209	4.087 <sup>**</sup>	1.727-9.674
Women with a disability	5.547 <sup>***</sup>	2.804-10.974	7.178 <sup>***</sup>	3.301-15.609
<b>Unmet need for mental health care due to cost</b>				
Women without a disability	1.424	.526-3.856	1.395	.512-3.796
Men with a disability	3.971 <sup>**</sup>	1.538-10.253	4.523 <sup>**</sup>	1.561-13.106
Women with a disability	6.768 <sup>***</sup>	2.847-16.088	7.163 <sup>***</sup>	2.674-19.185

Reference: Men without a disability

\* Adjusted for age, sex and other variables presented in Table 1.

\*  $p < 0.05$ , \*\*  $p < 0.01$ , \*\*\*  $p < 0.001$

Observations: 11,033

As seen in Table 3, people without a disability – both men and women – are less likely to have unmet health care needs than people with a disability. Particularly women with a disability are more likely to have unmet needs in health care, being 7.2 times more likely to have unmet needs due to cost of prescribed medicines and unmet mental health care needs due to cost, compared to men with no disability. This gender difference can be observed as well in Figure 2, which shows the estimated probabilities when the response variables is  $Y = 1$ , the predictor variable is *disability\_gender* (a categorical variable with four categories, encompassing ‘disability’ and ‘gender’, as in Table 3), and the other predictor variables are held at their mean.

**Figure 2 (2a, 2b, 2c, 2d, 2e)**

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As observed in Figures 2a-2e, the probability of all ‘unmet needs’ increases significantly for women with a disability. The pattern than we can observe in these sub-figures (with one exception in Figure 2b) is that men without a disability are the least likely to have an unmet health care need, followed by women without a disability, then by men with a disability, and finally by women with a disability.

**DISCUSSION**

In this study, we investigated health care access for people with disabilities in the UK. Our hypotheses were that: a) people with disabilities would be more likely to have unmet health care needs and b) women would be more likely to report unmet health care needs than men. The results supported both of these hypotheses: people with disabilities reported worse access to health care, with transportation, cost, and long waiting lists being the main barriers. Furthermore, women reported worse access to health care than men, across all categories. These findings are particularly worrying as they illustrate that a section of the population, who may have higher health care needs, face increased barriers in accessing much-needed services.

The strengths of the study are that it includes a nationally-representative sample and that it focuses on several factors that affect access to healthcare, such as transportation and cost. One of the limitations of the study is that we cannot make any causal inferences as to the reasons for the observed inequalities in access to health care due to the cross-sectional nature of the data. Furthermore, the EHIS relies on self-reporting information, which leaves the instrument open to response bias; however, there is no relevant information on this aspect. This might have had an effect on the data, since studies have shown that there are gender differences to self-reported health, with women consistently reporting poorer health status than men.[24]

We found that people with a severe disability are the ones most likely to have an unmet health care need, being 7.5 times more likely to have an unmet mental health care need due to cost, than people without a disability. On the other hand, people with a mild disability were almost four times more likely to have an unmet need due to cost of prescribed medicine, than people with no disability. These results agree with previous research. Popplewell, Rechel and Abel[13] demonstrated how adults with physical disability in England report worse access to primary care, while Allerton and Emerson[25] found similar inequalities in a UK national study with people with chronic conditions or impairments. By specifically exploring access by gender, and by including cost-related factors, this study expands the existing body of knowledge.

The findings are alarming for various reasons. People with disabilities often have greater health care needs and therefore may need to access health care services more than the general population.[25] The existence of barriers in their access to health care may further compromise their health leading to a vicious cycle: poorer access to healthcare can lead to even poorer health. There is evidence, for example, that people with disabilities face barriers in accessing cancer-screening services leading to lower use of such services compared with the general population,[26, 27] with subsequent delays in diagnosis.[28]

Furthermore, the results indicate that cost is a factor that affects utilisation of health care, including prescription medication. While NHS Wales, NHS Scotland, and Health and Social Care in Northern Ireland have abolished prescription charges, NHS England, where the majority of the UK population reside and seek to access health care services, has not. Currently, NHS England offers exemptions from prescription charges to several categories of service users[29] but most of the service users,



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including most people with disabilities, need to pay. This has led to a high proportion of people who do not collect prescription medications due to cost.[30]

The results also show that women with a disability were more likely to have an unmet health care access need from all other groups (for example, they were 7.2 times more likely to have an unmet need due to cost of prescribed medicines, if compared to men without a disability), followed by men with a disability (for instance, they were 4.5 times more likely to have an unmet mental health care need due to cost), and then by women without a disability (1.4 times more likely to have an unmet need due to long waiting lists, compared to men with no disability). Our results agree with other international studies that have underlined gender differences in barriers to health care.[31, 32]

The fact that these results come from the UK, a country with a national, and free at-the-point-of-access health care system (apart from prescriptions), is particularly worrying. The NHS aims to provide equal access to the population but this does not seem to be distributed equitably, especially when we consider utilisation of services and not only their availability. The results show how the interaction of disability and gender can create a structural disadvantage for disabled women, who report the worst access to health care from any other group. One of the reasons for this may be the invisibility of the broader social dimensions of gender within health care systems, including the NHS. Previous research [31, 32] shows that health care systems often do not recognise the additional barriers that women may face when they seek health care; such barriers may, for example, be due to lower income or higher caring responsibilities compared to men.

Issues of access to health care speak to wider issues rather than merely to the lack of appropriate transportation or financial resources. Whittaker and Leng[33]

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3 argue that the sicker people are and the more medical procedures they require, the  
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5 more valuable they can become for private health care facilities. We propose that  
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7 conversely in an overburdened public health system, like the NHS, which operates  
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9 within a neoliberal system valuing cost-effectiveness and resource prioritisation,[34]  
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11 people with disabilities might be implicitly viewed as ‘costly’ bodies, instead; in other  
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13 words, as people who use limited resources. This might in part explain Gibson and  
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15 O’Connor’s finding[12] that people with disabilities feel like patients of low priority.  
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19 In order to develop effective policies to move to a more equitable health care  
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21 access, it is important to explore in detail the reasons behind the worse access to  
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23 health care services for people with disabilities, acknowledging the significance of  
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25 gender in any exploration of access to services. It is important to embrace an  
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27 intersectionality approach, focusing on multiple inequalities.[35] Such an approach  
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29 would enable the acknowledgment of how multiple factors, such as disability, gender,  
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31 and the social and financial realities these are embedded in, affect access to health  
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33 care. This is important in order to determine the actual accessibility of health care,  
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35 rather than anticipated access based on the availability of services or the provision of  
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37 health coverage, which do not always acknowledge people’s specific needs (e.g.  
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39 transportation needs to reach a health care facility). Finally, it is equally important to  
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41 understand that health inequalities are largely based on disparities in wider health  
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43 determinants and therefore, policies aimed at achieving a more equitable distribution  
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45 of health, need to address broader socioeconomic inequalities.  
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## 51 Contributors

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DS and ESR jointly conceived the final research question and aims and objectives, reviewed the literature, produced the analysis plan and carried out the analysis, and drafted the manuscript.

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**Competing interests**

None declared.

**Ethics approval**

None required.

**Data sharing statement**

Technical appendix and dataset available from the UK Data Service.

<https://discover.ukdataservice.ac.uk/catalogue/?sn=7881>

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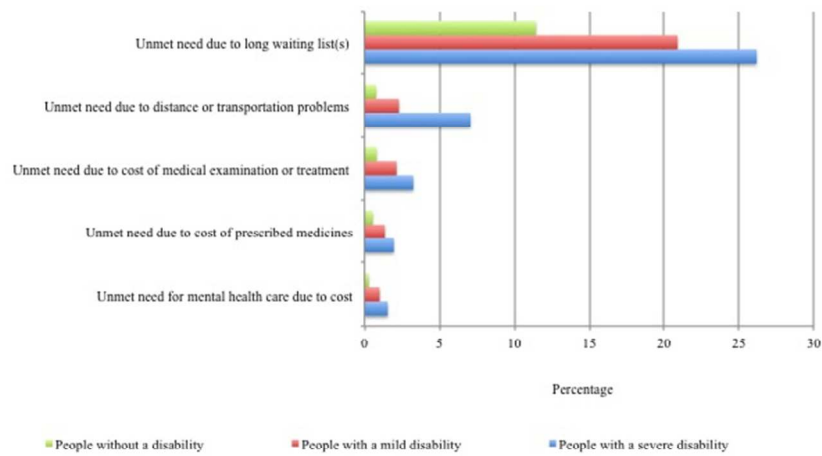
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**Figure legends**

**Figure 1:** People with unmet health care needs (%)

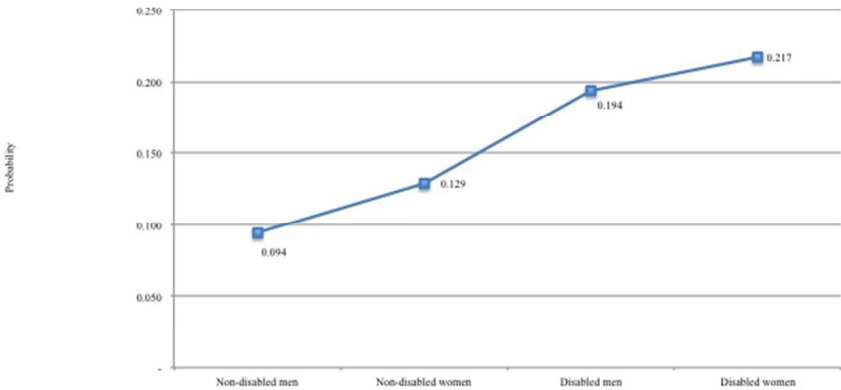
**Figure 2:** Estimated probabilities for unmet needs to health care with *disability\_gender* as predictor variable

- 2a) Estimated probabilities for Y=1: Unmet need due to long waiting list(s)
- 2b) Estimated probabilities for Y=1: Unmet need due to distance or transportation problems
- 2c) Estimated probabilities for Y=1: Unmet need due to cost of medical examination or treatment
- 2d) Estimated probabilities for Y=1: Unmet need due to cost of prescribed medicines
- 2e) Estimated probabilities for Y=1: Unmet need for mental health care due to cost



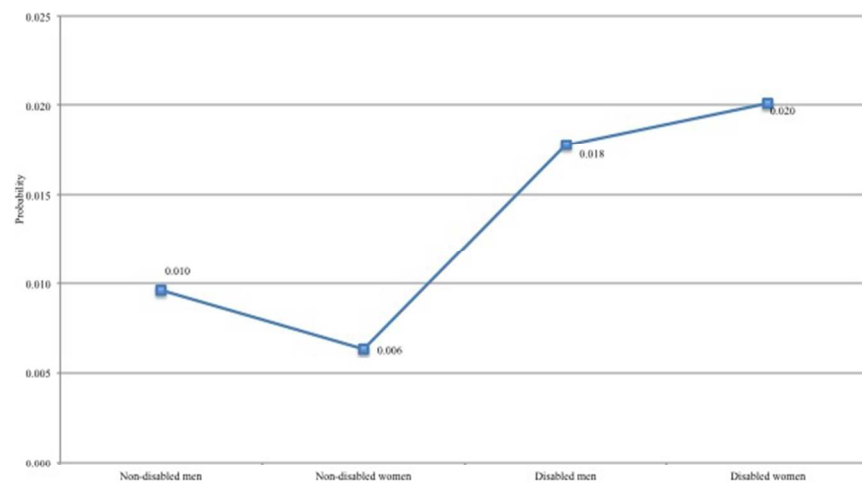
People with unmet health care needs (%)

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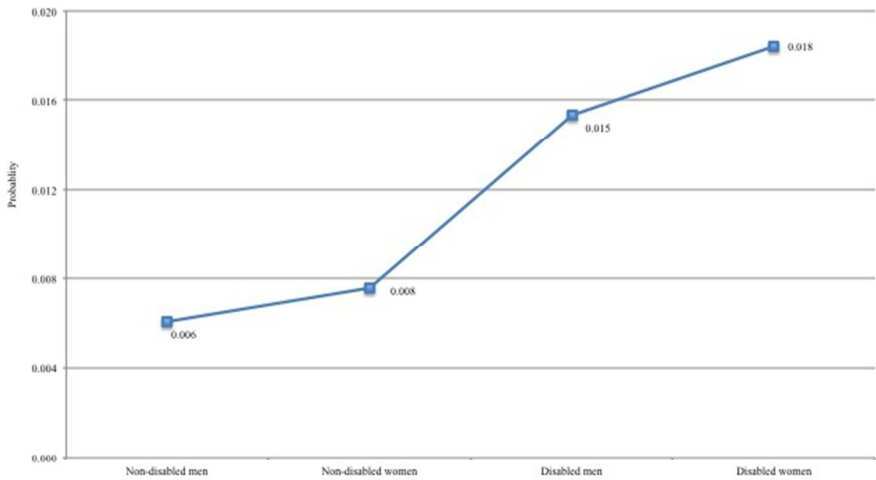
Estimated probabilities for Y=1: Unmet need due to long waiting list(s)

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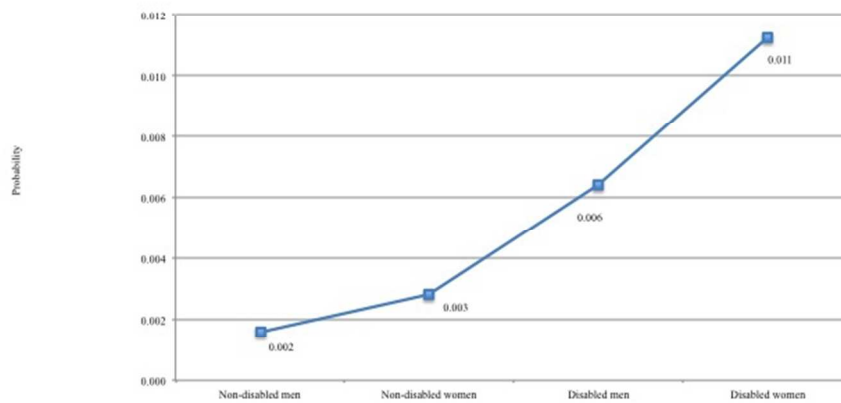
Estimated probabilities for Y=1: Unmet need due to distance or transportation problems

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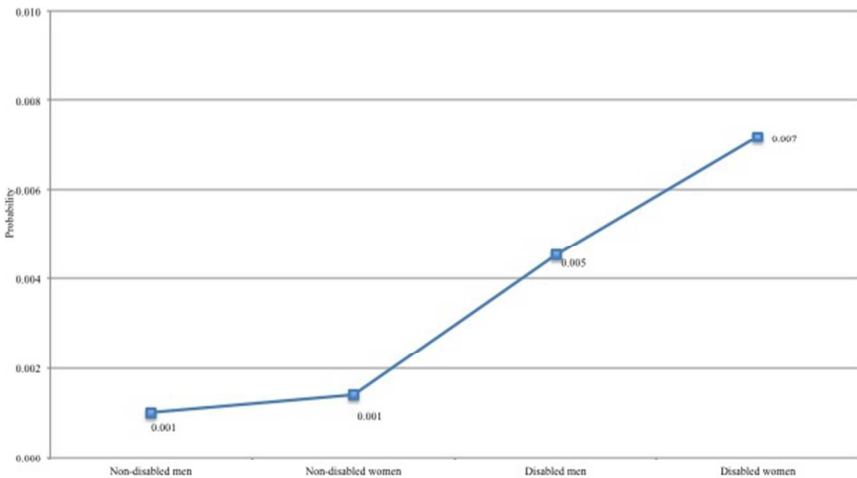
Estimated probabilities for Y=1: Unmet need due to cost of medical examination or treatment

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Estimated probabilities for Y=1: Unmet need due to cost of prescribed medicines

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Estimated probabilities for Y=1: Unmet need for mental health care due to cost  
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# BMJ Open

## Access to health care for men and women with disabilities in the UK: a secondary analysis of cross-sectional data

Journal:	<i>BMJ Open</i>
Manuscript ID	bmjopen-2017-016614.R1
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<b>Primary Subject Heading</b>:	Health services research
Secondary Subject Heading:	Public health
Keywords:	Organisation of health services < HEALTH SERVICES ADMINISTRATION & MANAGEMENT, PUBLIC HEALTH, Disability, Health care access

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**Title: Access to health care for men and women with disabilities in the UK: a secondary analysis of cross-sectional data**

Dikaïos Sakellariou<sup>1</sup> and Elena S. Rotarou<sup>2</sup>

<sup>1</sup> Dikaïos Sakellariou

Corresponding author: Cardiff University, School of Healthcare Sciences,  
Eastgate House, Newport Road 35-43, Cardiff, CF24 0AB

Email: [sakellarioud@cardiff.ac.uk](mailto:sakellarioud@cardiff.ac.uk)

Telephone number: 02920687744

<sup>2</sup> Elena S. Rotarou

University of Chile, Department of Economics,  
Diagonal Paraguay 257, Office 1506, Santiago, 8330015, Chile

Email: [erotarou@fen.uchile.cl](mailto:erotarou@fen.uchile.cl)

Telephone number: (56-2) 978-3455

**Keywords:** Disabled persons; Health services for persons with disabilities; Health services accessibility; Health equity

**Word count:** 3592

**Access to health care for men and women with disabilities in the UK: a  
secondary analysis of cross-sectional data**

**ABSTRACT**

**Objectives:** The aim of this study was to investigate differences in access to health care between people with and without disabilities in the UK. The hypotheses were that: a) people with disabilities would be more likely to have unmet health care needs; and b) there would be gender differences, with women more likely to report unmet needs.

**Setting and Participants:** We performed secondary analysis, using logistic regressions, of de-identified cross-sectional data from the European Health Interview Survey, Wave 2. The sample included 12,780 community-dwelling people over the age of 16 from across the UK, 5,230 of whom had a disability. The survey method involved face-to-face and telephone interviews.

**Outcome measures:** Unmet need for health care due to long waiting lists, or distance or transportation problems; not being able to afford medical examination, treatment, mental health care, or prescribed medicines. All measures were self-reported.

**Results:** Adjusting for age, sex, and other factors, people with a severe disability had higher odds of facing unmet needs. The largest gap was in 'unmet need for mental health care due to cost', where people with a severe disability were 4.5 times (CI 95%: 2.15-9.18) more likely to face a problem, as well as in 'unmet need due to cost of prescribed medicine', where people with a mild disability had 3.6 (CI 95%: 2.16-5.86) higher odds of facing a difficulty. Women with a disability were 7.2 times (CI 95%: 2.69-19.36) more likely to have unmet needs due to cost of care or medication, compared to men with no disability.

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**Conclusions:** People with disabilities reported worse access to health care, with transportation, cost, and long waiting lists being the main barriers. These findings are worrying as they illustrate that a section of the population, who may have higher health care needs, faces increased barriers in accessing services.

**Strengths and limitations of this study**

- This study is based on a nationally-representative sample of community-dwelling men and women.
- We used a variety of outcome measures to capture the reasons that impact access to health care for people with disabilities.
- All outcome measures were self-reported, which may have introduced response bias.
- The study’s cross-sectional design precludes any causal inference.

## INTRODUCTION

Disability is common in the population in the UK. According to the Equality Act 2010,[1] a person is disabled if they have a physical or mental impairment that has a substantial and long-term negative effect on their daily life. This definition moves beyond biomedical definitions that equate impairment with disability and addresses the social dimension of disability. It is estimated that 19% of the population live with a disability.[2] Despite this, disabled people's access to health care services in the UK has been little explored. Access to health care has several dimensions: service availability, utilisation of services, and relevance of services.[3] In this article, we focus on the utilisation of services and barriers to it, with a specific emphasis on unmet health care needs.

The British National Health Service (NHS) has been built on the principle of delivering equal access to health care for all. As Wenzl, McCuskee and Mossialos[4] stress, the NHS should be expected to work towards greater access to health care and a reduction in health inequalities. However, the extent that this has either been realised or operationalised through the establishment of concrete policies is debatable.[5] Powell and Exworthy[6] argue that most of the NHS policies that aim to provide an equitable service, focus on service availability rather than on any other dimension of access and conclude that there is a "...discrepancy between the 'paper' aim of equal access and the operational aim of equal provision" (p.59). The 2010 Equity and Excellence document[7] put service accessibility at its core, but failed to either acknowledge people's differential demands to health care or the different resources that people have at their disposal.

In the UK, there are well-evidenced, long-standing inequalities both in terms of access to health care, unmet need, and health outcomes.[8-11] However, there is

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only limited information about access to health care for people with disabilities. The available information shows that people with disabilities report worse access (including physical access into buildings) to services and worse satisfaction with provided services, that their needs are not recognised, and that they generally face several barriers, both structural (e.g. lack of transportation), financial, and cultural (e.g. misconceptions about disability).[12-14] Various studies have shown that disability is an added impediment in accessing health services. [15-19] A systematic review[13] on access to health care demonstrated that “...disabled people are restricted in accessing health care and report less satisfaction with their medical care” (p.21). Some of the barriers to health care access include lack of transport and inaccessible buildings.[13] People with disabilities often report that their needs are not understood or that they are treated as patients of low priority.[13] There is also a gender dimension, with women with disabilities often facing additional barriers in accessing health care services.[20]

The aim of this study is to explore access to health care for people with disabilities in the United Kingdom, and more specifically, to uncover possible differences in unmet health care needs between people with and without disabilities. Another aim of the study is to examine if there are gender differences in access to health care for people with disabilities. This study seeks to contribute to existing knowledge regarding access to health care for disabled people in the UK, by producing population-level evidence, and exploring the role of factors – such as cost and long waiting lists – as significant determinants behind barriers to such services. This knowledge can guide policy makers in the design of comprehensive support systems to enable real access to services, addressing not only the availability of services but also their utilisation.

In this article, we use the term *people with disabilities* to refer to people who have a long-standing (more than 6 months) health condition or impairment and experience activity limitations, as per the available data from the European Health Interview Survey (EHIS, Wave 2).

## METHODOLOGY

### Hypotheses

The study's hypotheses are that: a) people with disabilities are more likely to have unmet health care needs; and b) there are gender differences in unmet health care needs, with women more likely to report more unmet needs than men.

### Methods

We performed secondary analysis, using logistic regressions, of de-identified cross-sectional data from EHIS, Wave 2. The UK opted out from the first EHIS wave (2006-2009), but did take part in the 2014 EHIS, Wave 2. Data for England, Wales, and Scotland were collected between April 2013 and March 2014 and for Northern Ireland between April and September 2014. The survey was carried out as a follow-up to the Labour Force Survey (LFS). In England, Wales, and Scotland individuals who did not object in their final wave of contact, in the sampled households, completed the EHIS Wave 2 questionnaire. In Northern Ireland, a simple random sample of households on the Land and Property Services Agency property gazetteer, listing private households in Northern Ireland, was used.[21] Access to the dataset was granted by the UK Data Service ([www.ukdataservice.ac.uk](http://www.ukdataservice.ac.uk)).

The sample design stratified households by a) country (England, Wales, Scotland, and Northern Ireland), b) mode (face-to-face interviews, accounting for 20% of all interviews, and telephone interviews), and c) final wave of LFS

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contact.[21] The UK survey targeted individuals over the age of 16[21] and included a total of 20,161 observations, a sample size which was much higher than the estimated minimum effective size for the country, which was 13,085.[22] The microdata did not include any information, such as names or addresses, that would allow direct identification. In order to ensure a high level of confidentiality, a set of anonymisation rules was applied.[23]

The EHIS consisted of four modules: a) socioeconomic and demographic variables, such as age, sex, marital status, etc.; b) variables on health status, for example self-assessed health, chronic conditions, limitations in daily activities, etc.; c) variables on health care use, such as consultations, unmet needs, preventive actions, etc.; and d) health determinants, for instance weight, smoking, alcohol consumption, etc.[24] The questions analyse 21 areas of health concerns / related behaviours, and 81 specific item-questions.[25] All of the measures are self-reported, relying on the answers given by participants.

**Data and variables**

In order to define the variable ‘disability’, the answers to two questions were merged into a new variable. The first question (HS2) was “Long-standing health problem: Suffer from any illness or health problem of a duration of at least six months” with answers yes/no. The second one (HS3) was “General activity limitation: Limitation in activities people usually do because of health problems for at least the past six months”, with the possible answers being ‘severely limited’, ‘limited but no severely’, and ‘not limited at all’. Thus, the variable ‘disability’ included three possible answers: ‘no disability’ (that is, no long-standing health problem), ‘mild disability’ (people who answered ‘yes’ to HS2, and ‘limited but not severely’ to HS3), and ‘severe

disability' (people who answered 'yes' to HS2, and 'severely limited' to HS3).

According to this categorisation, the total number of observations for 'disability' was 15,488; due to case-deletion (default in STATA), 12,780 observations were included in this study.

Case-deletion - which analyses cases with available data on each variable - did not reduce statistical power, since  $n$  is adequately high and the sample is representative of the target population. Regarding introducing bias, we agree with Allison,[26] who stated that "if listwise deletion still leaves you with a large sample, you might reasonably prefer it over maximum likelihood or multiple imputation [...]. The other methods either get the standard errors wrong, the parameter estimates wrong, or both. At a minimum, listwise deletion gives you "honest" standard errors that reflect the actual amount of information used." (no page).

We used the following five binary variables to assess unmet health care needs:

a) Unmet need for health care in the past 12 months due to long waiting list(s); b) Unmet need for health care in the past 12 months due to distance or transportation problems; c) Could not afford medical examination or treatment in the past 12 months; d) Could not afford prescribed medicines in the past 12 months; e) Could not afford mental health care (by a psychologist or a psychiatrist, for example) in the past 12 months. All of these are self-reported measures.

The control variables include the following: a) *gender*: male / female; b) *age*: 16-29 / 30-44 / 45-59 / 60-79 / 80+; c) *civil status*: unmarried / married / widowed / divorced; d) *region*: England, Wales, Scotland, Northern Ireland; e) *urbanisation level*: densely-populated area / intermediate-populated area / thinly-populated area; f) *nationality*: British / not British; g) *employment*: employed / unemployed / inactive; h) *education*: secondary / tertiary, technical / tertiary, university; i) *health self-*



assessment: good / fair / bad; and j) *income quintiles* (net monthly equivalised household income): below 1<sup>st</sup> quintile / between 1<sup>st</sup> and 2<sup>nd</sup> quintile / between 2<sup>nd</sup> and 3<sup>rd</sup> quintile / between 3<sup>rd</sup> and 4<sup>th</sup> quintile / between 4<sup>th</sup> and 5<sup>th</sup> quintile (for more information on the variables, please see <http://ec.europa.eu/eurostat/web/products-manuals-and-guidelines/-/KS-RA-13-018>). We performed logistic regressions using STATA Version SE 11.2 to investigate a) unmet health care needs between people with and without disabilities; and b) unmet health care needs between men and women.

RESULTS

Descriptive statistics

Table 1 summarises the characteristics of the study sample.

**Table 1:** Comparison among people without a disability, people with a mild disability, and people with a severe disability

Parameter	Without a disability (n=7,550)		With a mild disability (n=3,761)		With a severe disability (n=1,469)		<i>p</i> value, chi-squared test <sup>§</sup>
	n	%	n	%	n	%	
Gender							
Male (n=5,573)	3,345	44.3	1,595	42.4	633	43.1	<i>p</i> = 0.182
Female (n=7,207)	4,205	55.7	2,166	57.6	836	56.9	
Age groups							
16-29 (n=1,077)	898	11.9	147	3.9	32	2.2	<i>p</i> < 0.0001
30-44 (n=2,685)	2,114	28.0	440	11.7	131	8.9	
45-59 (n=3,387)	2,159	28.6	850	22.6	378	25.7	
60-79 (n=4,827)	2,144	28.4	1,956	52.0	727	49.5	
80+ (n=806)	234	3.1	369	9.8	203	13.8	
Urbanisation (degree)							
Densely-populated area (n=7,570)	4,447	58.9	2,253	59.9	870	59.2	<i>p</i> = 0.978
Intermediate-populated area (n=3,416)	2,039	27.0	989	26.3	388	26.4	

Thinly-populated area (n=1,796)		1,065	14.1	519	13.8	212	14.4	
<b>Regions</b>								
	England (n=10,549)	6,244	82.7	3,133	83.3	1,172	79.8	$p = 0.002$
	Wales (n=592)	317	4.2	184	4.9	91	6.2	
	Scotland (n=1,103)	672	8.9	316	8.4	115	7.8	
	Northern Ireland (n=536)	317	4.2	128	3.4	91	6.2	
<b>Civil status</b>								
	Not married (n=2,389)	1,706	22.6	496	13.2	187	12.7	$p < 0.0001$
	Married (n=6,995)	4,394	58.2	1,944	51.7	657	44.7	
	Widowed (n=1,747)	642	8.5	748	19.9	357	24.3	
	Divorced (n=1,649)	808	10.7	572	15.2	269	18.3	
<b>Nationality</b>								
	British (n=12,279)	7,157	94.8	3,682	97.9	1,440	98.0	$p < 0.0001$
	Not British (n=501)	393	5.2	79	2.1	29	2.0	
<b>Employment</b>								
	Employed (n=5,752)	4,507	59.7	1,091	29.0	154	10.5	$p < 0.0001$
	Unemployed (n=551)	310	4.1	188	5.0	53	3.6	
	Inactive (n=6,477)	2,733	36.2	2,482	66.0	1,262	85.9	
<b>Education</b>								
	Secondary (n=8,558)	4,606	61.0	2,764	73.5	1,188	80.9	$p < 0.0001$
	Tertiary, technical (n=1,954)	1,231	16.3	553	14.7	170	11.6	
	Tertiary, university (n=2,268)	1,714	22.7	444	11.8	110	7.5	
<b>Health self-assessment</b>								
	Bad (n=1,389)	23	0.3	530	14.1	836	56.9	$p < 0.0001$
	Fair (n=2,626)	408	5.4	1,771	47.1	447	30.4	
	Good (n=8,766)	7,120	94.3	1,459	38.8	187	12.7	
<b>Income quintiles</b>								
	Below 1 <sup>st</sup> quintile (n=2,770)	1,261	16.7	1,012	26.9	497	33.8	$p < 0.0001$
	Between 1 <sup>st</sup> and 2 <sup>nd</sup> quintile (n=2,760)	1,480	19.6	880	23.4	400	27.2	
	Between 2 <sup>nd</sup> and 3 <sup>rd</sup> quintile (n=2,555)	1,472	19.5	801	21.3	282	19.2	
	Between 3 <sup>rd</sup> and 4 <sup>th</sup> quintile (n=2,431)	1,699	22.5	545	14.5	187	12.7	
	Between 4 <sup>th</sup> and 5 <sup>th</sup> quintile (n=2,265)	1,638	21.7	523	13.9	104	7.1	

§ Sex and age-adjusted

Figure 1 shows the frequency distribution of unmet health care needs in the UK between people without a disability, people with a mild disability, and people with a severe disability.

**Figure 1**

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As can be seen in Figure 1, the highest percentage of people with unmet health care needs are people with a severe disability. The highest percentage of people having an unmet need is the one related to long waiting list, and the smallest one is the one associated with unmet need for mental health care due to cost. All differences are statistically significant.

**Logistic regressions**

Logistic regressions were employed in order to investigate the impact of various factors on unmet needs for health care in the UK. The first logistic regressions (Table 2) looked into unmet health care needs between people without a disability, people with a mild disability, and people with a severe disability. The results in Table 2 include firstly sex and age-adjusted odds ratios, and then fully-adjusted ratios (adjusted for all variables available in Table 1). No collinearity distorted the results. There was a relatively higher correlation between the five groups of *age* (with a variance inflation factor-VIF between 2.33 and 5.30). However, this is often the case when dealing with dummy variables that represent a categorical variable with three or more categories, and – being relatively small – they have no effect on the regression.[27] The mean VIF for all variables was 1.86. The results of the logistic regressions are shown in Table 2.

**Table 2:** Unmet needs for health care between people without a disability, people with a mild disability, and people with a severe disability,  
Adjusted odds ratios

Parameters	Sex and age adjusted OR (95% C.I.)	Fully-adjusted OR (95% C.I.)
<b>1. Unmet need due to long waiting list(s)</b>		
People with a mild disability	2.37 *** (2.12-2.65)	1.98 *** (1.72-2.27)
People with a severe disability	3.24 *** (2.81-3.73)	2.38 *** (1.96-2.89)
<b>2. Unmet need due to distance or transportation problems</b>		
People with a mild disability	3.37 *** (2.40-4.72)	1.93 ** (1.26-2.95)
People with a severe disability	11.37 *** (8.15-15.87)	4.32 *** (2.66-7.00)
<b>3. Unmet need due to cost of medical examination or treatment</b>		
People with a mild disability	3.80 *** (2.69-5.35)	2.12 ** (1.37-3.30)
People with a severe disability	6.54 *** (4.46-9.60)	3.35 *** (1.94-5.80)
<b>4. Unmet need due to cost of prescribed medicines</b>		
People with a mild disability	4.15 *** (2.76-6.26)	3.56 *** (2.16-5.86)
People with a severe disability	6.51 *** (4.04-10.48)	5.39 *** (2.77-10.50)
<b>5. Unmet need for mental health care due to cost</b>		
People with a mild disability	4.15 *** (2.76-6.26)	4.45 *** (2.15-9.18)
People with a severe disability	6.51 *** (4.04-10.48)	7.24 *** (2.89-18.15)

Reference: People without a disability

\*\*  $p < 0.01$ , \*\*\*  $p < 0.001$

Observations= 1) 12,780; 2) 12,840; 3) 12,831; 4) 11,677; 5) 11,278

As it can be seen from Table 2, people with a severe disability are the most likely to face unmet needs, followed by people with a mild disability. The largest gap can be seen in the category of 'unmet need for mental health care due to cost', where people with a disability were from 4.5 to 7.2 times more likely to face a problem, as well as in the category 'unmet need due to cost of prescribed medicine', where they were from 3.6 to 5.4 times more likely to face a difficulty. Transportation was also an important barrier, with people with a disability being between 2 and 4.3 times more likely to face an unmet need because of this. The smallest gap was in 'unmet need due

to long waiting list(s)', where people with disabilities were 2 to 2.4 times more likely to face a problem than people without a disability.

The logistic regressions in Table 3 show gender differences in unmet health care needs. The two subcategories of disability (mild and severe) were joined into one, 'people with disabilities'. Thus, we have four categories: men without disabilities, women without disabilities, men with disabilities, and women with disabilities.

**Table 3:** Gender differences in unmet health care needs,  
Adjusted odds ratios

Parameters	Age-adjusted OR		Fully-adjusted OR	
	OR	95% C.I.	OR	95% C.I.
<b>1. Unmet need due to long waiting list(s)</b>				
Women without a disability	1.37***	1.19-1.59	1.40***	1.20-1.62
Men with a disability	2.97***	2.54- 3.48	2.31***	1.92-2.77
Women with a disability	3.27***	2.82-3.78	2.60***	2.18-3.09
<b>2. Unmet need due to distance or transportation problems</b>				
Women without a disability	.83	.51-1.37	.74	.44-1.23
Men with a disability	4.30***	2.77-6.66	1.70*	1.01-2.87
Women with a disability	5.35***	3.56-8.06	2.05**	1.25-3.37
<b>3. Unmet need due to cost of medical examination or treatment</b>				
Women without a disability	1.18	.70-1.97	1.22	.73-2.05
Men with a disability	4.25***	2.57-7.03	2.12*	1.19-3.81
Women with a disability	5.54***	3.50-8.78	2.89***	1.67-4.99
<b>4. Unmet need due to cost of prescribed medicines</b>				
Women without a disability	1.47	.79-2.74	1.42	.76- 2.65
Men with a disability	5.22***	2.76- 9.87	3.92***	1.92- 8.01
Women with a disability	6.70***	3.75-11.95	5.20***	2.68- 10.09
<b>5. Unmet need for mental health care due to cost</b>				
Women without a disability	1.49	.56-3.97	1.55	.58- 4.16
Men with a disability	7.37***	2.85-19.09	4.82**	1.68-13.87
Women with a disability	11.17***	4.68- 26.67	7.22***	2.69- 19.36

Reference: Men without a disability

\*  $p < 0.05$ , \*\*  $p < 0.01$ , \*\*\*  $p < 0.001$

Observations=: 1) 12,780; 2) 12,840; 3) 12,831; 4) 11,677; 5) 11,278

As seen in Table 3, people without a disability – both men and women – were less likely to have unmet health care needs than people with a disability, with disabled

women consistently facing more barriers than disabled men. Women with a disability were 7.2 times more likely to have unmet mental health care needs due to cost and 5.2 times more likely to have unmet needs due to cost of prescribed medicines, compared to men with no disability. Also, men with disabilities were more likely to face difficulties than men without disabilities: for example, disabled men were 3.9 times more likely to have an unmet health care need due to the cost of prescribed medicines. The pattern that we can observe in Table 3 is that men without a disability are the least likely to have an unmet health care need, followed by women without a disability, then by men with a disability, and finally by women with a disability.

## DISCUSSION

In this study, we investigated health care access for people with disabilities in the UK. Our hypotheses were that: a) people with disabilities would be more likely to have unmet health care needs and b) women would be more likely to report unmet health care needs than men. The results supported both of these hypotheses: people with disabilities reported worse access to health care, with transportation, cost, and long waiting lists being the main barriers. Furthermore, women reported worse access to health care than men, across all categories. These findings are particularly worrying as they illustrate that a section of the population, who may have higher health care needs, face increased barriers in accessing much-needed services.

The strengths of the study are that it includes a nationally-representative sample and that it focuses on several factors that affect access to health care, such as transportation and cost. One of the limitations of the study is that we cannot make any causal inferences as to the reasons for the observed inequalities in access to health care due to the cross-sectional nature of the data. Furthermore, the EHIS relies on

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self-reporting information, which leaves the instrument open to response bias; however, there is no relevant information on this aspect. This might have had an effect on the data, since studies have shown that there are gender differences to self-reported health, with women consistently reporting poorer health status than men.[28] Also, disability was self-assessed, with limited questions and it was not possible to disaggregate the results by impairment type. Finally, the EHIS did not collect any qualitative data in relation to the mechanisms that lead to compromised access to health care and how this is experienced by people with disabilities.

We found that people with a severe disability are the ones most likely to have an unmet health care need, being 7.2 times more likely to have an unmet mental health care need due to cost, than people without a disability. On the other hand, people with a mild disability were 3.6 times more likely to have an unmet need due to the cost of prescribed medicine, than people with no disability. These results agree with previous research. Popplewell, Rechel and Abel[14] demonstrated how adults with physical disability in England report worse access to primary care, while Allerton and Emerson[29] found similar inequalities in a UK national study with people with chronic conditions or impairments. Other research from the UK has shown that people with disabilities report worse experiences of cancer care.[30]

The available information from various countries suggests that people with disabilities are generally less likely to have good access to health care, compared to people without.[15-18] Access to preventive services is also affected. Several studies have evidenced how people with disabilities experience compromised access to cancer screening services.[31-34].

People with disabilities face structural, financial, and cultural/ attitudinal barriers when they seek to access health care.[35] Difficulties in accessing health care

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3 can be caused by: lack of transport, inaccessible buildings, and inadequate training of  
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5 health care professionals, among other factors.[13,19] People with disabilities often  
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7 report that they feel their needs are not understood, that they do not feel listened to,  
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9 and that they are perceived as patients of low priority due to their pre-existing  
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11 condition.[19] Such difficulties can be further compounded by the systematic  
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13 exclusion that people with disabilities often face, exemplified by lower employment  
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15 rates, lower income levels, and higher levels of poverty than the general  
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17 population.[36]  
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21 The findings are alarming for various reasons. People with disabilities often  
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23 have greater health care needs and therefore may need to access health care services  
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25 more than the general population.[29] The existence of barriers in their access to  
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27 health care may further compromise their health leading to a vicious cycle: poorer  
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29 access to health care can lead to even poorer health. Barriers in accessing cancer-  
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31 screening services can lead to lower use of such services compared with the general  
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33 population, with subsequent delays in diagnosis.[34]  
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37 Furthermore, the results indicate that cost is a factor that affects utilisation of  
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39 health care, including prescription medication. While NHS Wales, NHS Scotland, and  
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41 Health and Social Care in Northern Ireland have abolished prescription charges, NHS  
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43 England, where the majority of the UK population reside and seek to access health  
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45 care services, has not. Currently, NHS England offers exemptions from prescription  
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47 charges to several categories of service users[37] but most of the service users,  
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49 including most people with disabilities, need to pay. This has led to a high proportion  
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51 of people who do not collect prescription medications due to cost.[38]  
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55 The intersections between disability, socioeconomic condition, and gender  
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57 affect access to health care. Previous studies show, for example, that access to health  
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care is mediated by the type of health service provider, which is in turn mediated by income.[39]. As people with disabilities are often excluded from the job market and they also have higher daily living costs (for instance, increased heating costs if they spend more time at home, or out-of-pocket payments for equipment),[40] they often cannot afford to pay for private coverage or out of pocket payments for medication. In their study, Beatty et al,[39] found that people “with the poorest health and with the lowest incomes were the least likely to receive all health services needed” (p.1417). Low income can affect access to health care in various ways through, for example, reduced access to suitable transportation, and reduced ability to pay for medication, or make out-of-pocket payments. This has a gender dimension too, with women consistently reporting worse access to health care.[20]

The results show that women with a disability were more likely to have an unmet health care need than any of the other groups (for example, they were 7.2 times more likely to have an unmet mental health care need due to cost, if compared to men without a disability), followed by men with a disability (for instance, they were almost 4 times more likely to have an unmet health care need due to cost of prescribed medicines), and then by women without a disability (1.4 times more likely to have an unmet need due to long waiting lists, compared to men with no disability). Our results agree with other international studies that have underlined gender differences in barriers to health care.[41,42] One of the reasons for this may be the invisibility of the broader social dimensions of gender within health care systems, including the NHS. Health care systems often do not recognise the additional barriers that women may face when they seek health care; such barriers may, for example, be due to lower income or higher caring responsibilities compared to men.[41,42]

The fact that these results come from the UK, a country with a national, public, and free at-the-point-of-access health care system (apart from prescriptions), is particularly worrying. The NHS aims to provide equal access to the population but this does not seem to be distributed equitably, especially when we consider utilisation of services and not only their availability. The results show how the interaction of disability and gender can create a structural disadvantage for disabled women, who report the worst access to health care from any other group.

In order to develop effective policies to move towards a more equitable health care access, it is important to explore in detail the reasons behind the worse access to health care services for people with disabilities, acknowledging the significance of gender in any exploration of access to services. It is important to acknowledge how multiple factors, such as disability, gender, and the social and financial realities these are embedded in, affect access to health care. This is important in order to determine the actual accessibility of health care, rather than anticipated access based on the availability of services or the provision of health coverage, which do not always acknowledge people's specific needs (e.g. transportation needs to reach a health care facility). Finally, it is equally important to understand that health inequalities are largely based on disparities in wider health determinants and therefore, policies aimed at achieving a more equitable distribution of health, need to address broader socioeconomic inequalities.

### **Contributors**

DS and ESR jointly conceived the final research question and aims and objectives, reviewed the literature, produced the analysis plan and carried out the analysis, and drafted the manuscript.

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**Competing interests**

None declared.

**Ethics approval**

None required.

**Data sharing statement**

Technical appendix and dataset available from the UK Data Service.

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**Figure legends**

**Figure 1:** People with unmet health care needs (%)

For peer review only

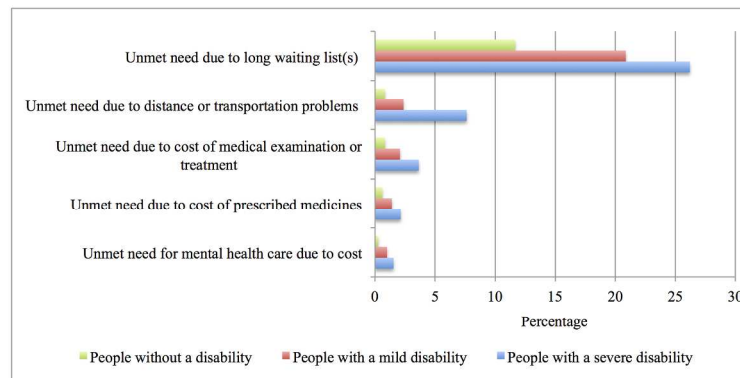


Figure 1: People with unmet health care needs (%)

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STROBE Statement—Checklist of items that should be included in reports of *cross-sectional studies*

	Item No	Recommendation
Title and abstract	X 1	X p.1 (a) Indicate the study’s design with a commonly used term in the title or the abstract
		X p.2 (b) Provide in the abstract an informative and balanced summary of what was done and what was found
Introduction		
Background/rationale	X p.4-5 2	Explain the scientific background and rationale for the investigation being reported
Objectives	X p.5-6 3	State specific objectives, including any prespecified hypotheses
Methods		
Study design	X p.2, p. 6 4	Present key elements of study design early in the paper
Setting	X p.6 5	Describe the setting, locations, and relevant dates, including periods of recruitment, exposure, follow-up, and data collection
Participants	X p. 6-7 6	(a) Give the eligibility criteria, and the sources and methods of selection of participants
Variables	X p. 7-8 7	Clearly define all outcomes, exposures, predictors, potential confounders, and effect modifiers. Give diagnostic criteria, if applicable
Data sources/ measurement	X p. 7-8 8*	For each variable of interest, give sources of data and details of methods of assessment (measurement). Describe comparability of assessment methods if there is more than one group
Bias	X p. 8 9	Describe any efforts to address potential sources of bias
Study size	X p. 6-7 10	Explain how the study size was arrived at
Quantitative variables	X p. 7-9 11	Explain how quantitative variables were handled in the analyses. If applicable, describe which groupings were chosen and why
Statistical methods	X 12	X p. 6-7 (a) Describe all statistical methods, including those used to control for confounding
		(b) Describe any methods used to examine subgroups and interactions
		X p.8 (c) Explain how missing data were addressed
		(d) If applicable, describe analytical methods taking account of sampling strategy
		(e) Describe any sensitivity analyses
Results		
Participants	X 13*	X p. 7, p. 8 (a) Report numbers of individuals at each stage of study—eg numbers potentially eligible, examined for eligibility, confirmed eligible, included in the study, completing follow-up, and analysed
		(b) Give reasons for non-participation at each stage
		(c) Consider use of a flow diagram
Descriptive data	X 14*	X p.9-10 (a) Give characteristics of study participants (eg demographic, clinical, social) and information on exposures and potential confounders
		(b) Indicate number of participants with missing data for each variable of interest
Outcome data	X p. 6 15*	Report numbers of outcome events or summary measures
Main results	X p.12, p. 13 16	X (a) Give unadjusted estimates and, if applicable, confounder-adjusted estimates and their precision (eg, 95% confidence interval). Make clear which confounders were adjusted for and why they were included

		<b>X p.9 (b)</b> Report category boundaries when continuous variables were categorized
		(c) If relevant, consider translating estimates of relative risk into absolute risk for a meaningful time period
Other analyses	17	Report other analyses done—eg analyses of subgroups and interactions, and sensitivity analyses
<b>Discussion</b>		
Key results	<b>X p.14</b> 18	Summarise key results with reference to study objectives
Limitations	<b>X p.14-15</b> 19	Discuss limitations of the study, taking into account sources of potential bias or imprecision. Discuss both direction and magnitude of any potential bias
Interpretation	<b>X p. 17-18</b> 20	Give a cautious overall interpretation of results considering objectives, limitations, multiplicity of analyses, results from similar studies, and other relevant evidence
Generalisability	<b>X p.14</b> 21	Discuss the generalisability (external validity) of the study results
<b>Other information</b>		
Funding	<b>X p.19</b> 22	Give the source of funding and the role of the funders for the present study and, if applicable, for the original study on which the present article is based

\*Give information separately for exposed and unexposed groups.

**Note:** An Explanation and Elaboration article discusses each checklist item and gives methodological background and published examples of transparent reporting. The STROBE checklist is best used in conjunction with this article (freely available on the Web sites of PLoS Medicine at <http://www.plosmedicine.org/>, Annals of Internal Medicine at <http://www.annals.org/>, and Epidemiology at <http://www.epidem.com/>). Information on the STROBE Initiative is available at [www.strobe-statement.org](http://www.strobe-statement.org).

# BMJ Open

## Access to health care for men and women with disabilities in the UK: a secondary analysis of cross-sectional data

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Secondary Subject Heading:	Public health
Keywords:	Organisation of health services < HEALTH SERVICES ADMINISTRATION & MANAGEMENT, PUBLIC HEALTH, Disability, Health care access

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**Title: Access to health care for men and women with disabilities in the UK: a secondary analysis of cross-sectional data**

Dikaïos Sakellariou<sup>1</sup> and Elena S. Rotarou<sup>2</sup>

<sup>1</sup> Dikaïos Sakellariou

Corresponding author: Cardiff University, School of Healthcare Sciences,  
Eastgate House, Newport Road 35-43, Cardiff, CF24 0AB

Email: [sakellarioud@cardiff.ac.uk](mailto:sakellarioud@cardiff.ac.uk)

Telephone number: 02920687744

<sup>2</sup> Elena S. Rotarou

University of Chile, Department of Economics,  
Diagonal Paraguay 257, Office 1506, Santiago, 8330015, Chile

Email: [erotarou@fen.uchile.cl](mailto:erotarou@fen.uchile.cl)

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**Keywords:** Disabled persons; Health services for persons with disabilities; Health services accessibility; Health equity

**Word count:** 3583

**Access to health care for men and women with disabilities in the UK: a  
secondary analysis of cross-sectional data**

**ABSTRACT**

**Objectives:** The aim of this study was to investigate differences in access to health care between people with and without disabilities in the UK. The hypotheses were that: a) people with disabilities would be more likely to have unmet health care needs; and b) there would be gender differences, with women more likely to report unmet needs.

**Setting and Participants:** We performed secondary analysis, using logistic regressions, of de-identified cross-sectional data from the European Health Interview Survey, Wave 2. The sample included 12,840 community-dwelling people over the age of 16 from across the UK, 5,236 of whom had a disability. The survey method involved face-to-face and telephone interviews.

**Outcome measures:** Unmet need for health care due to long waiting lists, or distance or transportation problems; not being able to afford medical examination, treatment, mental health care, or prescribed medicines. All measures were self-reported.

**Results:** Adjusting for age, sex, and other factors, people with a severe disability had higher odds of facing unmet needs. The largest gap was in 'unmet need for mental health care due to cost', where people with a severe disability were 4.5 times (CI 95%: 2.2-9.2) more likely to face a problem, as well as in 'unmet need due to cost of prescribed medicine', where people with a mild disability had 3.6 (CI 95%: 2.2-5.9) higher odds of facing a difficulty. Women with a disability were 7.2 times (CI 95%: 2.7-19.4) more likely to have unmet needs due to cost of care or medication, compared to men with no disability.

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**Conclusions:** People with disabilities reported worse access to health care, with transportation, cost, and long waiting lists being the main barriers. These findings are worrying as they illustrate that a section of the population, who may have higher health care needs, faces increased barriers in accessing services.

**Strengths and limitations of this study**

- This study is based on a nationally-representative sample of community-dwelling men and women.
- We used a variety of outcome measures to capture the reasons that impact access to health care for people with disabilities.
- All outcome measures were self-reported, which may have introduced response bias.
- The study’s cross-sectional design precludes any causal inference.



## INTRODUCTION

Disability is common in the population in the UK. According to the Equality Act 2010,[1] a person is disabled if they have a physical or mental impairment that has a substantial and long-term negative effect on their daily life. This definition moves beyond biomedical definitions that equate impairment with disability and addresses the social dimension of disability. It is estimated that 19% of the population live with a disability.[2] Despite this, disabled people's access to health care services in the UK has been little explored. Access to health care has several dimensions: service availability, utilisation of services, and relevance of services.[3] In this article, we focus on the utilisation of services and barriers to it, with a specific emphasis on unmet health care needs.

The British National Health Service (NHS) has been built on the principle of delivering equal access to health care for all. As Wenzl, McCuskee and Mossialos[4] stress, the NHS should be expected to work towards greater access to health care and a reduction in health inequalities. However, the extent that this has either been realised or operationalised through the establishment of concrete policies is debatable.[5] Powell and Exworthy[6] argue that most of the NHS policies that aim to provide an equitable service, focus on service availability rather than on any other dimension of access and conclude that there is a "...discrepancy between the 'paper' aim of equal access and the operational aim of equal provision" (p.59). The 2010 Equity and Excellence document[7] put service accessibility at its core, but failed to either acknowledge people's differential demands to health care or the different resources that people have at their disposal.

In the UK, there are well-evidenced, long-standing inequalities both in terms of access to health care, unmet need, and health outcomes.[8-11] However, there is

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only limited information about access to health care for people with disabilities. The available information shows that people with disabilities report worse access (including physical access into buildings) to services and worse satisfaction with provided services, that their needs are not recognised, and that they generally face several barriers, both structural (e.g. lack of transportation), financial, and cultural (e.g. misconceptions about disability).[12-14] Various studies have shown that disability is an added impediment in accessing health services. [15-19] A systematic review[13] on access to health care demonstrated that “...disabled people are restricted in accessing health care and report less satisfaction with their medical care” (p.21). Some of the barriers to health care access include lack of transport and inaccessible buildings.[13] People with disabilities often report that their needs are not understood or that they are treated as patients of low priority.[13] There is also a gender dimension, with women with disabilities often facing additional barriers in accessing health care services.[20]

The aim of this study is to explore access to health care for people with disabilities in the United Kingdom, and more specifically, to uncover possible differences in unmet health care needs between people with and without disabilities. Another aim of the study is to examine if there are gender differences in access to health care for people with disabilities. This study seeks to contribute to existing knowledge regarding access to health care for disabled people in the UK, by producing population-level evidence, and exploring the role of factors – such as cost and long waiting lists – as significant determinants behind barriers to such services. This knowledge can guide policy makers in the design of comprehensive support systems to enable real access to services, addressing not only the availability of services but also their utilisation.

The study's hypotheses are that: a) people with disabilities are more likely to have unmet health care needs; and b) there are gender differences in unmet health care needs, with women more likely to report more unmet needs than men.

In this article, we use the term *people with disabilities* to refer to people who have a long-standing (more than 6 months) health condition or impairment and experience activity limitations, as per the available data from the European Health Interview Survey (EHIS, Wave 2).

## METHODOLOGY

### Methods

We performed secondary analysis, using logistic regressions, of de-identified cross-sectional data from EHIS, Wave 2. The UK opted out from the first EHIS wave (2006-2009), but did take part in the 2014 EHIS, Wave 2. Data for England, Wales, and Scotland were collected between April 2013 and March 2014 and for Northern Ireland between April and September 2014. The survey was carried out as a follow-up to the Labour Force Survey (LFS). In England, Wales, and Scotland individuals who did not object in their final wave of contact, in the sampled households, completed the EHIS Wave 2 questionnaire. In Northern Ireland, a simple random sample of households on the Land and Property Services Agency property gazetteer, listing private households in Northern Ireland, was used.[21] Access to the dataset was granted by the UK Data Service ([www.ukdataservice.ac.uk](http://www.ukdataservice.ac.uk)).

The sample design stratified households by a) country (England, Wales, Scotland, and Northern Ireland), b) mode (face-to-face interviews, accounting for 20% of all interviews, and telephone interviews), and c) final wave of LFS contact.[21] The UK survey targeted individuals over the age of 16[21] and included

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a total of 20,161 observations, a sample size which was much higher than the estimated minimum effective size for the country, which was 13,085.[22] The microdata did not include any information, such as names or addresses, that would allow direct identification. In order to ensure a high level of confidentiality, a set of anonymisation rules was applied.[23]

The EHIS consisted of four modules: a) socioeconomic and demographic variables, such as age, sex, marital status, etc.; b) variables on health status, for example self-assessed health, chronic conditions, limitations in daily activities, etc.; c) variables on health care use, such as consultations, unmet needs, preventive actions, etc.; and d) health determinants, for instance weight, smoking, alcohol consumption, etc.[24] The questions analyse 21 areas of health concerns / related behaviours, and 81 specific item-questions.[25] All of the measures are self-reported, relying on the answers given by participants.

**Data and variables**

In order to define the variable ‘disability’, the answers to two questions were merged into a new variable. The first question (HS2) was “Long-standing health problem: Suffer from any illness or health problem of a duration of at least six months” with answers yes/no. The second one (HS3) was “General activity limitation: Limitation in activities people usually do because of health problems for at least the past six months”, with the possible answers being ‘severely limited’, ‘limited but no severely’, and ‘not limited at all’. Thus, the variable ‘disability’ included three possible answers: ‘no disability’ (that is, no long-standing health problem), ‘mild disability’ (people who answered ‘yes’ to HS2, and ‘limited but not severely’ to HS3), and ‘severe disability’ (people who answered ‘yes’ to HS2, and ‘severely limited’ to HS3).

According to this categorisation, the total number of observations for ‘disability’ was 15,493. Due to case-deletion (default in STATA), the sample size varies between 11,278 and 12,840 observations; since we wanted to maximise sample size / power, we allowed for slight fluctuations in sample sizes. Case-deletion - which analyses cases with available data on each variable - did reduce statistical power; however, since we still have a large sample, statistical power is considered sufficiently high. The sample is representative of the target population, in terms of disability and age (for testing and descriptive statistics between full sample and study’s sample, please see Supplementary Material 1 and 2).

Regarding introducing bias, we agree with Allison,[26] who stated that “if listwise deletion still leaves you with a large sample, you might reasonably prefer it over maximum likelihood or multiple imputation [...] The other methods either get the standard errors wrong, the parameter estimates wrong, or both. At a minimum, listwise deletion gives you ‘honest’ standard errors that reflect the actual amount of information used.” (no page).

We used the following five binary variables to assess unmet health care needs:

a) Unmet need for health care in the past 12 months due to long waiting list(s); b) Unmet need for health care in the past 12 months due to distance or transportation problems; c) Could not afford medical examination or treatment in the past 12 months; d) Could not afford prescribed medicines in the past 12 months; e) Could not afford mental health care (by a psychologist or a psychiatrist, for example) in the past 12 months. All of these are self-reported measures.

The control variables include the following: a) *gender*: male / female; b) *age*: 16-29 / 30-44 / 45-59 / 60-79 / 80+; c) *civil status*: unmarried / married / widowed / divorced; d) *region*: England, Wales, Scotland, Northern Ireland; e) *urbanisation*

level: densely-populated area / intermediate-populated area / thinly-populated area; f) nationality: British / not British; g) employment: employed / unemployed / inactive; h) education: secondary / tertiary, technical / tertiary, university; i) health self-assessment: good / fair / bad; and j) income quintiles (net monthly equivalised household income): below 1<sup>st</sup> quintile / between 1<sup>st</sup> and 2<sup>nd</sup> quintile / between 2<sup>nd</sup> and 3<sup>rd</sup> quintile / between 3<sup>rd</sup> and 4<sup>th</sup> quintile / between 4<sup>th</sup> and 5<sup>th</sup> quintile (for more information on the variables, please see <http://ec.europa.eu/eurostat/web/products-manuals-and-guidelines/-/KS-RA-13-018>). We performed logistic regressions using STATA Version SE 11.2 to investigate a) unmet health care needs between people with and without disabilities; and b) unmet health care needs between men and women.

RESULTS

Descriptive statistics

Table 1 summarises the characteristics of the study sample.

Table 1: Comparison among people without a disability, people with a mild disability, and people with a severe disability

Parameter		Without a disability (n=7,550)		With a mild disability (n=3,761)		With a severe disability (n=1,469)		p value, chi-squared test <sup>§</sup>
		n	%	n	%	n	%	
Gender								p = 0.182
	Male (n=5,573)	3,345	44.3	1,595	42.4	633	43.1	
	Female (n=7,207)	4,205	55.7	2,166	57.6	836	56.9	
Age groups								p < 0.0001
	16-29 (n=1,077)	898	11.9	147	3.9	32	2.2	
	30-44 (n=2,685)	2,114	28.0	440	11.7	131	8.9	
	45-59 (n=3,387)	2,159	28.6	850	22.6	378	25.7	
	60-79 (n=4,827)	2,144	28.4	1,956	52.0	727	49.5	

	80+ (n=806)	234	3.1	369	9.8	203	13.8	
Urbanisation (degree)								
	Densely-populated area (n=7,570)	4,447	58.9	2,253	59.9	870	59.2	p = 0.978
	Intermediate-populated area (n=3,416)	2,039	27.0	989	26.3	388	26.4	
	Thinly-populated area (n=1,796)	1,065	14.1	519	13.8	212	14.4	
Regions								
	England (n=10,549)	6,244	82.7	3,133	83.3	1,172	79.8	p = 0.002
	Wales (n=592)	317	4.2	184	4.9	91	6.2	
	Scotland (n=1,103)	672	8.9	316	8.4	115	7.8	
	Northern Ireland (n=536)	317	4.2	128	3.4	91	6.2	
Civil status								
	Not married (n=2,389)	1,706	22.6	496	13.2	187	12.7	p < 0.0001
	Married (n=6,995)	4,394	58.2	1,944	51.7	657	44.7	
	Widowed (n=1,747)	642	8.5	748	19.9	357	24.3	
	Divorced (n=1,649)	808	10.7	572	15.2	269	18.3	
Nationality								
	British (n=12,279)	7,157	94.8	3,682	97.9	1,440	98.0	p < 0.0001
	Not British (n=501)	393	5.2	79	2.1	29	2.0	
Employment								
	Employed (n=5,752)	4,507	59.7	1,091	29.0	154	10.5	p < 0.0001
	Unemployed (n=551)	310	4.1	188	5.0	53	3.6	
	Inactive (n=6,477)	2,733	36.2	2,482	66.0	1,262	85.9	
Education								
	Secondary (n=8,558)	4,606	61.0	2,764	73.5	1,188	80.9	p < 0.0001
	Tertiary, technical (n=1,954)	1,231	16.3	553	14.7	170	11.6	
	Tertiary, university (n=2,268)	1,714	22.7	444	11.8	110	7.5	
Health self-assessment								
	Bad (n=1,389)	23	0.3	530	14.1	836	56.9	p < 0.0001
	Fair (n=2,626)	408	5.4	1,771	47.1	447	30.4	
	Good (n=8,766)	7,120	94.3	1,459	38.8	187	12.7	
Income quintiles								
	Below 1 <sup>st</sup> quintile (n=2,770)	1,261	16.7	1,012	26.9	497	33.8	p < 0.0001
	Between 1 <sup>st</sup> and 2 <sup>nd</sup> quintile (n=2,760)	1,480	19.6	880	23.4	400	27.2	
	Between 2 <sup>nd</sup> and 3 <sup>rd</sup> quintile (n=2,555)	1,472	19.5	801	21.3	282	19.2	
	Between 3 <sup>rd</sup> and 4 <sup>th</sup> quintile (n=2,431)	1,699	22.5	545	14.5	187	12.7	
	Between 4 <sup>th</sup> and 5 <sup>th</sup> quintile (n=2,265)	1,638	21.7	523	13.9	104	7.1	

§ Sex and age-adjusted

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Figure 1 shows the frequency distribution of unmet health care needs in the UK between people without a disability, people with a mild disability, and people with a severe disability.

**Figure 1**

As can be seen in Figure 1, the highest percentage of people with unmet health care needs are people with a severe disability. The highest percentage of people having an unmet need is the one related to long waiting list, and the smallest one is the one associated with unmet need for mental health care due to cost. All differences are statistically significant.

**Logistic regressions**

Logistic regressions were employed in order to investigate the impact of various factors on unmet needs for health care in the UK. The first logistic regressions (Table 2) looked into unmet health care needs between people without a disability, people with a mild disability, and people with a severe disability. The results in Table 2 include firstly sex and age-adjusted odds ratios, and then fully-adjusted ratios (adjusted for all variables available in Table 1). No collinearity distorted the results. There was a relatively higher correlation between the five groups of *age* (with a variance inflation factor-VIF between 2.33 and 5.30). However, this is often the case when dealing with dummy variables that represent a categorical variable with three or more categories, and – being relatively small – they have no effect on the regression.[27] The mean VIF for all variables was 1.86. The results of the logistic regressions are shown in Table 2.



**Table 2:** Unmet needs for health care between people without a disability, people with a mild disability, and people with a severe disability,

Adjusted odds ratios

Parameters	Sex and age adjusted OR (95% C.I.)	Fully-adjusted OR (95% C.I.)
<b>1. Unmet need due to long waiting list(s)</b>		
People with a mild disability	2.37 *** (2.12-2.65)	1.98 *** (1.72-2.27)
People with a severe disability	3.24 *** (2.81-3.73)	2.38 *** (1.96-2.89)
<b>2. Unmet need due to distance or transportation problems</b>		
People with a mild disability	3.37 *** (2.40-4.72)	1.93 ** (1.26-2.95)
People with a severe disability	11.37 *** (8.15-15.87)	4.32 *** (2.66-7.00)
<b>3. Unmet need due to cost of medical examination or treatment</b>		
People with a mild disability	3.80 *** (2.69-5.35)	2.12 ** (1.37-3.30)
People with a severe disability	6.54 *** (4.46-9.60)	3.35 *** (1.94-5.80)
<b>4. Unmet need due to cost of prescribed medicines</b>		
People with a mild disability	4.15 *** (2.76-6.26)	3.56 *** (2.16-5.86)
People with a severe disability	6.51 *** (4.04-10.48)	5.39 *** (2.77-10.50)
<b>5. Unmet need for mental health care due to cost</b>		
People with a mild disability	4.15 *** (2.76-6.26)	4.45 *** (2.15-9.18)
People with a severe disability	6.51 *** (4.04-10.48)	7.24 *** (2.89-18.15)

Reference: People without a disability

\*\*  $p < 0.01$ , \*\*\*  $p < 0.001$

Observations=: 1) 12,780; 2) 12,840; 3) 12,831; 4) 11,677; 5) 11,278

As it can be seen from Table 2, people with a severe disability are the most likely to face unmet needs, followed by people with a mild disability. The largest gap can be seen in the category of 'unmet need for mental health care due to cost', where people with a disability were from 4.5 to 7.2 times more likely to face a problem, as well as

in the category ‘unmet need due to cost of prescribed medicine’, where they were from 3.6 to 5.4 times more likely to face a difficulty. Transportation was also an important barrier, with people with a disability being between 2 and 4.3 times more likely to face an unmet need because of this. The smallest gap was in ‘unmet need due to long waiting list(s)’, where people with disabilities were 2 to 2.4 times more likely to face a problem than people without a disability.

The logistic regressions in Table 3 show gender differences in unmet health care needs. The two subcategories of disability (mild and severe) were joined into one, ‘people with disabilities’. Thus, we have four categories: men without disabilities, women without disabilities, men with disabilities, and women with disabilities.

**Table 3:** Gender differences in unmet health care needs,  
Adjusted odds ratios

Parameters	Age-adjusted OR		Fully-adjusted OR	
	OR	95% C.I.	OR	95% C.I.
<b>1. Unmet need due to long waiting list(s)</b>				
Women without a disability	1.37***	1.19-1.59	1.40***	1.20-1.62
Men with a disability	2.97***	2.54- 3.48	2.31***	1.92-2.77
Women with a disability	3.27***	2.82-3.78	2.60***	2.18-3.09
<b>2. Unmet need due to distance or transportation problems</b>				
Women without a disability	.83	.51-1.37	.74	.44-1.23
Men with a disability	4.30***	2.77-6.66	1.70*	1.01-2.87
Women with a disability	5.35***	3.56-8.06	2.05**	1.25-3.37
<b>3. Unmet need due to cost of medical examination or treatment</b>				
Women without a disability	1.18	.70-1.97	1.22	.73-2.05
Men with a disability	4.25***	2.57-7.03	2.12*	1.19-3.81
Women with a disability	5.54***	3.50-8.78	2.89***	1.67-4.99
<b>4. Unmet need due to cost of prescribed medicines</b>				
Women without a disability	1.47	.79-2.74	1.42	.76- 2.65
Men with a disability	5.22***	2.76- 9.87	3.92***	1.92- 8.01
Women with a disability	6.70***	3.75-11.95	5.20***	2.68- 10.09
<b>5. Unmet need for mental health care due to cost</b>				
Women without a disability	1.49	.56-3.97	1.55	.58- 4.16
Men with a disability	7.37***	2.85-19.09	4.82**	1.68-13.87
Women with a disability	11.17***	4.68- 26.67	7.22***	2.69- 19.36

Reference: Men without a disability

\*  $p < 0.05$ , \*\*  $p < 0.01$ , \*\*\*  $p < 0.001$

Observations= 1) 12,780; 2) 12,840; 3) 12,831; 4) 11,677; 5) 11,278

As seen in Table 3, people without a disability – both men and women – were less likely to have unmet health care needs than people with a disability, with disabled women consistently facing more barriers than disabled men. Women with a disability were 7.2 times more likely to have unmet mental health care needs due to cost and 5.2 times more likely to have unmet needs due to cost of prescribed medicines, compared to men with no disability. Also, men with disabilities were more likely to face difficulties than men without disabilities: for example, disabled men were 3.9 times more likely to have an unmet health care need due to the cost of prescribed medicines. The pattern than we can observe in Table 3 is that men without a disability are the least likely to have an unmet health care need, followed by women without a disability, then by men with a disability, and finally by women with a disability.

## DISCUSSION

In this study, we investigated health care access for people with disabilities in the UK. Our hypotheses were that: a) people with disabilities would be more likely to have unmet health care needs and b) women would be more likely to report unmet health care needs than men. The results supported both of these hypotheses: people with disabilities reported worse access to health care, with transportation, cost, and long waiting lists being the main barriers. Furthermore, women reported worse access to health care than men, across all categories. These findings are particularly worrying as they illustrate that a section of the population, who may have higher health care needs, face increased barriers in accessing much-needed services.

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The strengths of the study are that it includes a nationally-representative sample and that it focuses on several factors that affect access to health care, such as transportation and cost. One of the limitations of the study is that we cannot make any causal inferences as to the reasons for the observed inequalities in access to health care due to the cross-sectional nature of the data. Furthermore, the EHIS relies on self-reporting information, which leaves the instrument open to response bias; however, there is no relevant information on this aspect. This might have had an effect on the data, since studies have shown that there are gender differences to self-reported health, with women consistently reporting poorer health status than men.[28] Also, disability was self-assessed, with limited questions and it was not possible to disaggregate the results by impairment type. Finally, the EHIS did not collect any qualitative data in relation to the mechanisms that lead to compromised access to health care and how this is experienced by people with disabilities.

We found that people with a severe disability are the ones most likely to have an unmet health care need, being 7.2 times more likely to have an unmet mental health care need due to cost, than people without a disability. On the other hand, people with a mild disability were 3.6 times more likely to have an unmet need due to the cost of prescribed medicine, than people with no disability. These results agree with previous research. Popplewell, Rechel and Abel[14] demonstrated how adults with physical disability in England report worse access to primary care, while Allerton and Emerson[29] found similar inequalities in a UK national study with people with chronic conditions or impairments. Other research from the UK has shown that people with disabilities report worse experiences of cancer care.[30]

The available information from various countries suggests that people with disabilities are generally less likely to have good access to health care, compared to

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3 people without.[15-18] Access to preventive services is also affected. Several studies  
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5 have evidenced how people with disabilities experience compromised access to  
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7 cancer screening services.[31-34].  
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10 People with disabilities face structural, financial, and cultural/ attitudinal  
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12 barriers when they seek to access health care.[35] Difficulties in accessing health care  
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14 can be caused by: lack of transport, inaccessible buildings, and inadequate training of  
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16 health care professionals, among other factors.[13,19] People with disabilities often  
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18 report that they feel their needs are not understood, that they do not feel listened to,  
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20 and that they are perceived as patients of low priority due to their pre-existing  
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22 condition.[19] Such difficulties can be further compounded by the systematic  
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24 exclusion that people with disabilities often face, exemplified by lower employment  
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26 rates, lower income levels, and higher levels of poverty than the general  
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28 population.[36]  
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32 The findings are alarming for various reasons. People with disabilities often  
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34 have greater health care needs and therefore may need to access health care services  
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36 more than the general population.[29] The existence of barriers in their access to  
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38 health care may further compromise their health leading to a vicious cycle: poorer  
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40 access to health care can lead to even poorer health. Barriers in accessing cancer-  
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42 screening services can lead to lower use of such services compared with the general  
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44 population, with subsequent delays in diagnosis.[34]  
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48 Furthermore, the results indicate that cost is a factor that affects utilisation of  
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50 health care, including prescription medication. While NHS Wales, NHS Scotland, and  
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52 Health and Social Care in Northern Ireland have abolished prescription charges, NHS  
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54 England, where the majority of the UK population reside and seek to access health  
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56 care services, has not. Currently, NHS England offers exemptions from prescription  
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charges to several categories of service users[37] but most of the service users, including most people with disabilities, need to pay. This has led to a high proportion of people who do not collect prescription medications due to cost.[38]

The intersections between disability, socioeconomic condition, and gender affect access to health care. Previous studies show, for example, that access to health care is mediated by the type of health service provider, which is in turn mediated by income.[39]. As people with disabilities are often excluded from the job market and they also have higher daily living costs (for instance, increased heating costs if they spend more time at home, or out-of-pocket payments for equipment),[40] they often cannot afford to pay for private coverage or out of pocket payments for medication. In their study, Beatty et al,[39] found that people “with the poorest health and with the lowest incomes were the least likely to receive all health services needed” (p.1417). Low income can affect access to health care in various ways through, for example, reduced access to suitable transportation, and reduced ability to pay for medication, or make out-of-pocket payments. This has a gender dimension too, with women consistently reporting worse access to health care.[20]

The results show that women with a disability were more likely to have an unmet health care need than any of the other groups (for example, they were 7.2 times more likely to have an unmet mental health care need due to cost, if compared to men without a disability), followed by men with a disability (for instance, they were almost 4 times more likely to have an unmet health care need due to cost of prescribed medicines), and then by women without a disability (1.4 times more likely to have an unmet need due to long waiting lists, compared to men with no disability). Our results agree with other international studies that have underlined gender differences in barriers to health care.[41,42] One of the reasons for this may be the

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3 invisibility of the broader social dimensions of gender within health care systems,  
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5 including the NHS. Health care systems often do not recognise the additional barriers  
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7 that women may face when they seek health care; such barriers may, for example, be  
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9 due to lower income or higher caring responsibilities compared to men.[41,42]  
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11 The fact that these results come from the UK, a country with a national,  
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13 public, and free at-the-point-of-access health care system (apart from prescriptions), is  
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15 particularly worrying. The NHS aims to provide equal access to the population but  
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17 this does not seem to be distributed equitably, especially when we consider utilisation  
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19 of services and not only their availability. The results show how the interaction of  
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21 disability and gender can create a structural disadvantage for disabled women, who  
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23 report the worst access to health care from any other group.  
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27 In order to develop effective policies to move towards a more equitable health  
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29 care access, it is important to explore in detail the reasons behind the worse access to  
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31 health care services for people with disabilities, acknowledging the significance of  
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33 gender in any exploration of access to services. It is important to acknowledge how  
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35 multiple factors, such as disability, gender, and the social and financial realities these  
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37 are embedded in, affect access to health care. This is important in order to determine  
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39 the actual accessibility of health care, rather than anticipated access based on the  
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41 availability of services or the provision of health coverage, which do not always  
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43 acknowledge people's specific needs (e.g. transportation needs to reach a health care  
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45 facility). Finally, it is equally important to understand that health inequalities are  
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47 largely based on disparities in wider health determinants and therefore, policies aimed  
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49 at achieving a more equitable distribution of health, need to address broader  
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51 socioeconomic inequalities.  
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**Contributors**

DS and ESR jointly conceived the final research question and aims and objectives, reviewed the literature, produced the analysis plan and carried out the analysis, and drafted the manuscript.

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**Competing interests**

None declared.

**Ethics approval**

None required.

**Data sharing statement**

Technical appendix and dataset available from the UK Data Service.

<https://discover.ukdataservice.ac.uk/catalogue/?sn=7881>



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**Figure legends**

**Figure 1:** People with unmet health care needs (%)

For peer review only

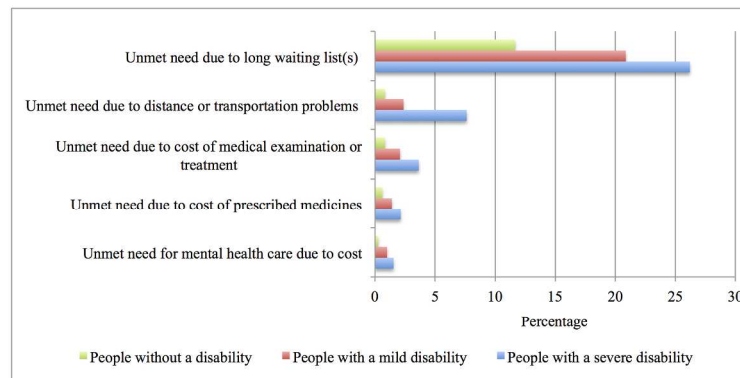


Figure 1: People with unmet health care needs (%)

215x279mm (300 x 300 DPI)

Supplementary material 1: Descriptive statistics (gender and age groups) for the full sample (15,493 observations) and the study sample (11,278 observations)

Full sample (15,493 observations)		Without a disability (n=9,404)		With a mild or severe disability (n=6,089)		p value, chi-squared test
Parameter		n	%	n	%	
Gender						p = 0.007
Male (n=6,954)		4,302	45.8	2,652	43.6	
Female (n=8,539)		5,102	54.2	3,437	56.4	
Age groups						p < 0.0001
16-29 (n=1,631)		1,383	14.7	248	4.1	
30-44 (n=3,098)		2,476	26.3	622	10.2	
45-59 (n=3,965)		2,602	27.7	1,363	22.4	
60-79 (n=5,811)		2,642	28.1	3,169	52.0	
80+ (n=988)		301	3.2	687	11.3	
Study sample (11,278 observations)		Without a disability (n=6,809)		With a mild or severe disability (n=4,469)		p value, chi-squared test
Parameter		n	%	n	%	
Gender						p = 0.010
Male (n=4,854)		2,997	44.02	1,857	41.55	
Female (n=6,424)		3,812	55.98	2,612	58.45	
Age groups						p < 0.0001
16-29 (n=934)		784	11.51	150	3.36	
30-44 (n=2,301)		1,836	26.96	465	10.41	
45-59 (n=2,967)		1,930	28.34	1,037	23.20	
60-79 (n=4,391)		2,035	29.89	2,356	52.72	
80+ (n=685)		224	3.29	461	10.32	



**Supplementary material 2:** Comparison of proportions between the full sample  
(15,493 observations) and the study sample (11,278 observations)

	Disability	Women	Age 16-29	Age 30-44	Age 45-59	Age 60-79	Age 80+
<b>Sample 1 (full)</b>	39.3%	55.1%	10.5%	20.0%	25.6%	37.5%	6.4%
<b>Sample 2 (study)</b>	39.6%	56.8%	8.3%	20.4%	26.3%	38.9%	6.1%
<b>Difference</b>	0.3%	1.7 %	2.3 %	0.4 %	0.7 %	1.4 %	0.3 %
<b>95% CI</b>	-0.86 - 1.52	0.49 - 2.91	1.54 - 2.95	-0.58 - 1.38	-0.35 - 1.79	0.24 - 2.61	-0.28 - 0.90
<b>Chi-squared</b>	0.30	7.65	38.14	0.65	1.76	5.58	1.07
<b>DF</b>	1	1	1	1	1	1	1
<b>Sig. level</b>	$p = 0.585$	$p = 0.006$	$p < 0.0001$	$p = 0.421$	$p = 0.184$	$p = 0.018$	$p = 0.301$

STROBE Statement—Checklist of items that should be included in reports of *cross-sectional studies*

	Item No	Recommendation
Title and abstract	X 1	X p.1 (a) Indicate the study’s design with a commonly used term in the title or the abstract
		X p.2 (b) Provide in the abstract an informative and balanced summary of what was done and what was found
Introduction		
Background/rationale	X p.4-5 2	Explain the scientific background and rationale for the investigation being reported
Objectives	X p.5-6 3	State specific objectives, including any prespecified hypotheses
Methods		
Study design	X p.2, p. 6 4	Present key elements of study design early in the paper
Setting	X p.6 5	Describe the setting, locations, and relevant dates, including periods of recruitment, exposure, follow-up, and data collection
Participants	X p. 6-7 6	(a) Give the eligibility criteria, and the sources and methods of selection of participants
Variables	X p. 7-8 7	Clearly define all outcomes, exposures, predictors, potential confounders, and effect modifiers. Give diagnostic criteria, if applicable
Data sources/ measurement	X p. 7-8 8*	For each variable of interest, give sources of data and details of methods of assessment (measurement). Describe comparability of assessment methods if there is more than one group
Bias	X p. 8 9	Describe any efforts to address potential sources of bias
Study size	X p. 6-7 10	Explain how the study size was arrived at
Quantitative variables	X p. 7-9 11	Explain how quantitative variables were handled in the analyses. If applicable, describe which groupings were chosen and why
Statistical methods	X 12	X p. 6-7 (a) Describe all statistical methods, including those used to control for confounding
		(b) Describe any methods used to examine subgroups and interactions
		X p.8 (c) Explain how missing data were addressed
		(d) If applicable, describe analytical methods taking account of sampling strategy
		(e) Describe any sensitivity analyses
Results		
Participants	X 13*	X p. 7, p. 8 (a) Report numbers of individuals at each stage of study—eg numbers potentially eligible, examined for eligibility, confirmed eligible, included in the study, completing follow-up, and analysed
		(b) Give reasons for non-participation at each stage
		(c) Consider use of a flow diagram
Descriptive data	X 14*	X p.9-10 (a) Give characteristics of study participants (eg demographic, clinical, social) and information on exposures and potential confounders
		(b) Indicate number of participants with missing data for each variable of interest
Outcome data	X p. 6 15*	Report numbers of outcome events or summary measures
Main results	X p.12, p. 13 16	X (a) Give unadjusted estimates and, if applicable, confounder-adjusted estimates and their precision (eg, 95% confidence interval). Make clear which confounders were adjusted for and why they were included

<b>X p.9 (b)</b> Report category boundaries when continuous variables were categorized		
(c) If relevant, consider translating estimates of relative risk into absolute risk for a meaningful time period		
Other analyses	17	Report other analyses done—eg analyses of subgroups and interactions, and sensitivity analyses
<b>Discussion</b>		
Key results	<b>X p.14</b> 18	Summarise key results with reference to study objectives
Limitations	<b>X p.14-15</b> 19	Discuss limitations of the study, taking into account sources of potential bias or imprecision. Discuss both direction and magnitude of any potential bias
Interpretation	<b>X p. 17-18</b> 20	Give a cautious overall interpretation of results considering objectives, limitations, multiplicity of analyses, results from similar studies, and other relevant evidence
Generalisability	<b>X p.14</b> 21	Discuss the generalisability (external validity) of the study results
<b>Other information</b>		
Funding	<b>X p.19</b> 22	Give the source of funding and the role of the funders for the present study and, if applicable, for the original study on which the present article is based

\*Give information separately for exposed and unexposed groups.

**Note:** An Explanation and Elaboration article discusses each checklist item and gives methodological background and published examples of transparent reporting. The STROBE checklist is best used in conjunction with this article (freely available on the Web sites of PLoS Medicine at <http://www.plosmedicine.org/>, Annals of Internal Medicine at <http://www.annals.org/>, and Epidemiology at <http://www.epidem.com/>). Information on the STROBE Initiative is available at [www.strobe-statement.org](http://www.strobe-statement.org).